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KNOTTING MATTERS

The Magazine of the International Guild of Knot Tyers

INTERNATIONAL GUILD OF KNOT TYERS

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KNOTTING MATTERS

THE MAGAZINE OF THE INTERNATIONAL GUILD OF KNOT TYERS

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The editors welcome the submission of letters, articles, photographs and sketches for publication. Correspondence may be by e-mail knottingmatters@igkt.net but more extensive items, such as articles for publication, as well as any pictures, which should be of good quality, need to be sent as attachments. All submissions must include their author's name and e-mail or postal address.

If events are to be publicised in *Knotting Matters*, note the months of publication - March, June, September and December. Although the deadline for the next issue is given at the foot of the Contents page, please note that the editors begin putting it together at least three weeks earlier.

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PLEASE NOTE: LETTERS & ARTICLES FOR THE DECEMBER 2020 *KNOTTING MATTERS* MUST BE RECEIVED BY 6th NOVEMBER 2020

FRONT COVER: Mac Mackenzie's Cherry Blossom marudai see article p28

President's Letter

I hope this letter finds you all safe and well from the effects of Covid-19. If you have been affected in whichever way, please accept my sympathy.

When I was asked to take over the position of President from Bob Dollar, I felt very honoured and humbled. Thank you Bob, for all your work as President over the past three years. As a token of its appreciation, the Guild presented Bob with a personalised fid crafted by Mikko Snellman (right).

Under normal circumstances, the new President is announced at the Guild AGM. Jane and I were looking forward to this year's meeting in the Wirral, but alas the pandemic has forced the cancellation of not only this meeting, but many other knot-tying events around the world.

What strange times we are living in. At the time of writing this, the UK is just emerging from our period of lockdown, some countries are almost virus-free and others still yet to reach their peak. Many of our members are categorised as vulnerable either due to age or underlying health conditions, or both. Only time will tell what the future holds for the format of Guild meetings.

The position of Guild President comes with no job description. I had hoped to have the opportunity to meet members at their main or branch meetings. Face to face interaction is one of the strong points of the IGKT and over the years we have been able to forge many friendships this way. With two hands and some cordage, communication between knotters does not need a common language.

Over the coming months, we may have to adapt to different ways of holding our meetings. Covid-19 has forced people to work differently. Many people and organisations are using digital media, such as Zoom, Skype or YouTube. Perhaps there is an opportunity here for the IGKT not only to keep in contact with those members who would regularly attend meetings, but also to reach out to the rest of our membership, especially those who live in remote places where a physical journey would be a major undertaking. Perhaps branches could collaborate and combine their expertise in running virtual meetings.

I look forward to the time when we can travel again safely and meet physically. Until then, stay safe and keep knotting.

Colin Grundy

EDITORIAL

There are a number of things to cover in this editorial, but we wish to start with the loss of a giant of the knotting world, author and master rigger Brion Toss. His books are very readable, witty and intensely practical with superb illustrations, just the job. (See pp43-46 for 2 obituaries).

Having felt pleased with ourselves for our bumper Covid edition, we rapidly discovered a series of errors for which we apologise. Since no-one has demanded our resignation, we'll soldier on for now.

Tyler Akins, whom we managed to misname Atkins (about which he graciously declined to complain), corrected the inaccurate representation of a Giant knot we had published (see his letter p8). Prusik versus Prussik versus Prussic. Having read Heinz Prohaska's letter, we editors discussed whether common English usage now favoured 'Prussik', but a quick check of several available authorities led us back to 'Prusik'.

You will, we hope, have noticed that we have ceded page 2 to Colin Grundy, (apologies to him for getting his name wrong inside June's front cover) our new President,who, having not had the opportunity to address members at the AGM, has taken up the pen.

We are gratified to see how many of you have responded to the request for information about your Covid-driven activities. Congratulations on all the achievements and keep up the good work! (pp12-18). The only thing that still allows us a close and intimate interaction with impunity is, of course, *KM*! We need your ideas on how to progress from here, so communicate, type, cough, and sneeze all you like, no problem, just type.

A regular comment/complaint that we receive is about image size. Now we have always tried to judge the size of knot drawings or pictures so that the strands of knots could be followed. However another comment about the detail lost in other images because of their size (p8) has been taken on board - we hope.

'How to ...' Pullouts: In this issue we are indebted to two members for their contributions. We would love to receive some feedback, as we're sure they would also.

As the Covid situation continues to fluctuate, We send our best wishes to all of you and your families. As discussions rage as to the right levels and forms of activity, the bottom line is that family and knotting matters more.

D, G & M

LETTERS TO THE EDITOR

Dear Maurice,
Adding to Geoffrey Budworth's royal house of knots (*KM* 147, p43), Admiral WH Smyth in his 1867 *Sailor's Word Book, A Dictionary of Nautical Terms,* begins his definition of the Fisherman's Bend with 'A knot, for simplicity called the king of all knots ...'.

John Shaw

Dear Maurice,
In your latest *KM* 147 p30, Colin Byfleet asked for the identity of the artist for the Double Constrictor on the page. Well, I went directly to Brion Toss *The Rigger's Locker*, where on p13 the drawings are identical. The artist is Robert Shetterly.

John Moreau

Dear Maurice,
Once upon a time, all good stories start that way, a sailor from Lancaster was captured by slavers. His fate was that the slavers were going to sell him on as a slave.

However, the Head Slaver being a bit of a sporting gent said, "if the sailor can tie an untieable knot we'll set him free". Before they locked him up for the night the sailor asked for a bottle of water and a length of rope.

The next morning they brought the sailor in front of the Head Slaver who asked the sailor what knot he had tied, the sailor's reply was the Figure of Eight.

All the slavers fell about laughing "any fool can untie the Figure of Eight", they shouted, "not so fast" said the sailor, and from out of his shirt he produced the untieable knot. True to the slaver's word, the sailor was set free and returned to Lancaster safe and sound.

So what did the sailor do to make the Figure of Eight knot untieable?

Eric Greenough

Dear Maurice,

I thought you might like to see the attached. This was sort of a collaborative work between Geoff Moore and myself.

Geoff has cornered a little niche with plaited handles and decorative THs on Auctioneers' Gavels. He asked, one day, if I thought it was possible to do the whole thing with a single strand.

Naturally I said "Of course!" then spent a couple of sleepless nights thinking about it. It's a much longer story but basically I came up with a design and made a mandrel for it at the Men's Shed.

(*Note the grid underlying the start of the covering - above. A printable version is on the website: Ed*)

After a couple of abortive attempts Geoff finally got it done. The knot is a 26Lx21B on the head with a "T" junction transition into a 60Lx10B down the handle worked with 5mm lace. He is well pleased with himself and I am well proud of his effort!

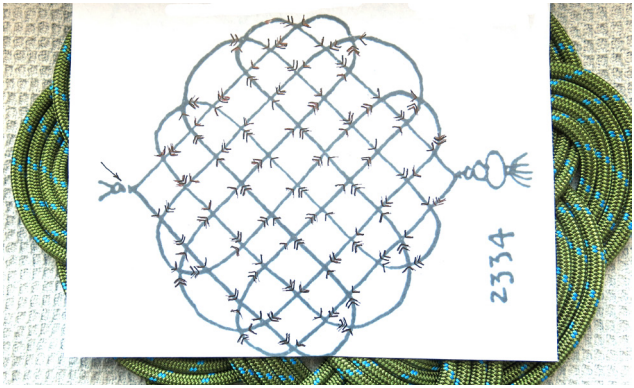
Jim Caswell

Dear Maurice:

Clifford Ashley writes that he came across the knot, which he pictures at *ABOK* #2334, as a decorative element on the end of a bugle cord. I decided to find out if it would make a nice mat.

Having constructed it, I was disappointed to note that it was structurally identical to the 7-strand Turkish Mat (*G&H* 307/308*).* However, all was not lost, since in order to tie it, I had to develop a more fool-proof design aid for my ageing brain, since Mr Ashley's 'direct method' (*ABOK* #2272) was confusing for me. So it was that, during an afternoon nap one day, I (literally) dreamed up the method as follows:

I took a close-up photograph of the knot, then printed it enlarged on a sheet of paper. With a black marker, commencing at a suitable point on the perimeter, I followed the strand through the knot marking off tucks as I went.

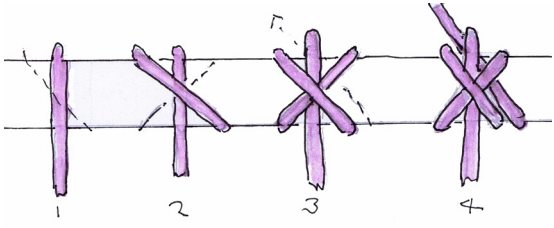


When the strand met an opposing strand I marked it with a single arrow if it was an over, or a double arrow if it was an under. This method had two important attributes. Firstly, a glance would indicate immediately if the tucks were marked correctly, since each tuck is composed of a single arrow and a double one. More importantly, the arrows indicate at all times in which direction the working end should be going, together with the type of tuck that should be made. If one finds that one is proceeding against the arrows, then the error is immediately spotted and correction involves at most a couple of tucks, rather than a complete dismantling (which has occasionally happened).

John Heselton

Dear Maurice,

I was rather surprised by an article in *KM* 147 by Kasper Ezelius on his two new knots the Grip hitch and the adjustable Grip loop. I think both knots are based on a knot used by Arborists who trust their lives to it, called a Blake hitch, a knot of four half hitches with a tucked working end through the bottom two loops. Kasper uses just two hitches with a tucked working end. He admits that his Grip hitch has two failings, it can only be pulled one way and the knot is difficult to untie, unlike the Snuggle hitch based on a modified Clove Hitch which can be pulled both ways and it was designed with an escape handle at the top of the hitch to free the knot no matter how tight the hitch is.

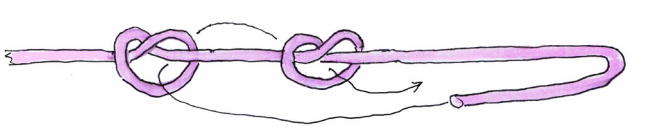


Snuggle hitch

His loop, aka Taut-Line hitch, is very similar to the Arrowhead hitch. The Arrowhead is easier to tie and technically more secure with three half hitches inside the loop and none outside, to just two inside Kasper's hitch and one outside.

These two hitches have a weak point. Tension can only be applied by pushing or pulling the knot forward towards the fixed end.

One hitch that overcomes this is a knot that I wish I had tied first. It was in *KM* about 10 or 12 years ago, it was a Taut-Line hitch sent in by a scout from Malta. He called it the Guyline hitch. It is based on two Overhand knots on the fixed main line. The line goes around or over the tent peg and through the two Overhands. The Overhands are closed and tension is applied by pulling back on the working end. When the required tension is reached, lock off the working end around the two lines with a half hitch under the first overhand for safety.



Guyline hitch

To tie a taut ridge line between two trees, tie two Overhand knots, take the line around the second tree clockwise, put the working end through the second overhand, close the knot, pull the working end tight and put the working end through the top Overhand, close the knot and pull tight (make the line sing).

For cosmetic reasons I prefer the two Overhands close to each tree (6 to 8 in), this gives you a double taut line. Half hitch the hitch for safety. Many thanks to the scout from Malta. Owen K Nuttall

Editors' note: It was Paul Calleja-Gera in KM 85, p44. His link still works http://www.shurdington.org/Scouts/GuylineHitch.htm.

Dear Maurice,

Re Loop, Hitch and Bight, *KM* 147 p28, before miniaturization and microelectronics really got up to speed, equipment was hand-built in factories by rows of production workers, soldering components in place and connecting wiring looms. When the original design was done, often little more than a rough sketch, it would be given to one of the artists of the electrical world, a prototype wireman. It would be their job to convert the sketch into hardware: the entire layout, from tin bashing, to component positioning, to the cable form to link everything together. It had to be compact, aesthetically pleasing, cost-effective and easy for the production workers to make quickly.

A main feature would be the cable form. A collection of often different gauges of wire, sometimes one colour, sometimes various.

One function was for wires to be brought out exactly where they would be needed, all had to be parallel, no crossed wires as it were, which obviates the time-consuming process of identifying the ends of the finished article.

This was achieved by ‘lacing’, using thin plastic covered nylon or thin flat tape.

It had to be very tightly done, so that when the forms were made for production they could be easily picked up, and fairly rigid.

Little fingers were often taped up to save skin, as if a slip occurred, it was too easy to slice to the bone.

The Marline hitching shown in the last edition demonstrates the method used in the lacing process, and as shown, the axial cord always enters and leaves underneath the radial component, to retain some integrity in case of a break in the cord.

W. Kerr

Dear Maurice,

It may be a matter of age but I do rather agree with Owen Nuttall about the size of the photos in many of the recent *KM*s. I suspect that part of the problem is that in preparing the pages the images appear larger and clearer on a screen than when printed. I appreciate that you produce a very full and varied magazine, but it would be even more enjoyable if the photos were a little larger so one can study the details more clearly. I suppose it is a job to fit everything in and you do not wish to miss out a contribution, in which case please just note my point, do not publish this, and use the space to allow for a couple of bigger photos.

Des Pawson

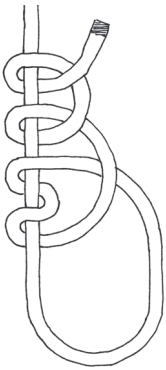
Editors' note: Thanks, Des. We're now doing both!

Dear Maurice,

Here's an idea to spark a debate. Did Ashley get it right when he said that a knot's use or method of tying was just as important as the structure? For instance, are the Sheet bend (*ABOK #1),* Weaver knot (#2), and Bathrobe cord knot (#1223) actually different knots?

If so, why are the alternate methods for a Sheet bend (shown as #1433 and #2562) not given with different names? Or is the method of tying immaterial and Ashley may have had a view that's different from current thinking? I am not through reading all of the back issues - has this topic been debated before?

The last issue of *KM* had a correction diagram detailing the Giant knot. The illustration had one of the crossings wrong, which turned the knot into three half hitches once dressed.



https://www.shoulderdoc.co.uk/news/view/427

https://tinyurl.com/y55mqfng

Tyler Akins

Editors' note: Tyler, we'd be only too happy if people engaged in the topic you suggest. Yes you are right, the image of the Giant knot was incorrect – another thing we missed! Thanks for your illustration of the correct version.

Dear Maurice,
Re *KM* 147, June 2020, p27.
Prusik's name was PRUSIK, not PRUSSIC. He was not the inventor of prussic acid! This application of the Prusik knot was already known by Kenneth Tarbuck, inventor of the Tarbuck knot. I corresponded with him a long time ago. He was nearly 100 years old, but in his head still OK. An Austrian climber used this application for tying-on in the years after WWII, Tarbuck said, that if he survived he was a lucky man.
The climber who used the knot shown in *KM* 147 was Franz Bachmann, inventor of the Bachmann knot. An English climber, Donald ??? had shown him a new knot for tying-on some years after WWII, probably the Tarbuck knot. Bachmann found the idea good and used the knot shown in *KM* 147. It looks as if he had forgotten how to tie the Tarbuck knot correctly. I spoke with Bachmann about 20 years ago, and we decided to call the knot he had used - the 'Donald' knot.
Tarbuck was, as far as I can tell, the first author of a climbing manual (*Nylon Rope and Climbing Safety,* published, it is supposed, 1953) who wrote that the Bowline can fail if used in a wrong way. I have made a drawing to show what is meant. In Austria, this application was usual and it was also used in mountain rescue, and shown to climbers under instruction.
In 1965, there was an accident, but the clubs continued to use the Bowline with no safety knot. I wrote some articles in the 1970s for *Alpinismus* and *Bergsteiger*, published in Munich, showing how easily the Bowline can come untied with stiff and slippery modern ropes. The Bowline was removed from the instructions. The older climbers continued to use the knot, and we had about half a dozen accidents in the German area, with some fatalities.

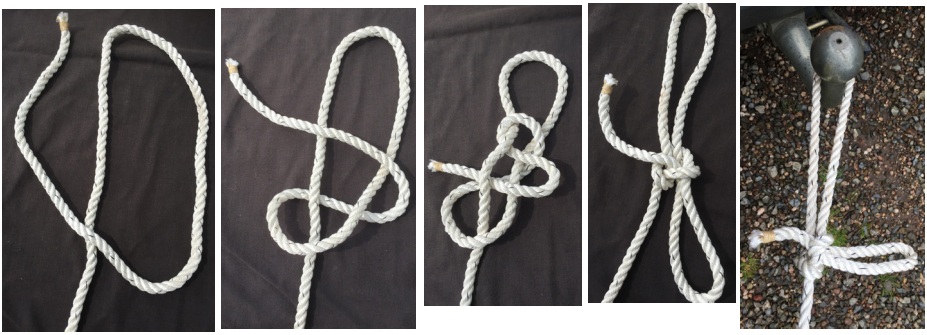
Heinz Prohaska
Editors' note: Heinz' article Who Invented the Prusik Knot? *was published in Die Alpen No3, 1997, pp50-51 and translated into Dutch for Het Knoopeknauwertje No7, 1997, pp4-7.*

Dear Maurice,
This knot was shown to me (several times it has to be said!) by Mr S Dallyn, farmer, and livestock dealer of some renown in North Devon, UK. He calls it the 'Ploughman's' knot, others may know it by another name, or may even know another knot by the same name. It would be extremely interesting to know if

it is rare, in common use, or unrecognised. Maybe Mr Dallyn is the last living exponent of the knot. A farmer a few miles away, who still works his farm and ploughs with horses, has never seen the knot before. It is reputed to take great strain without jamming, a useful attribute if, as its name suggests, it was used with horse-drawn ploughs.

One tip I discovered some time ago is, if you think a knot may jam, tie it with a stick inserted. When done, break the stick to give you a bit of slack to work the knot loose.

Back to the knot. I could have shuffled off my mortal coil without knowing of its existence but that, one day, Mr Dallyn said that after many years, he still didn't know my surname. I had fairly recently downloaded the Guild Logo software and had cards printed on line, with all my details on the other side, so I handed one over. Had he not seen the name IGKT, he would never have thought to mention the Ploughman's knot. These cards are more useful than I thought.



If there is no response to this letter, can any conclusions be drawn, bearing in mind the old adage about 'absence of proof'? Or does the knot have to be written up in the international press to overcome members' inexplicable reticence?

PS If you get round to tying it, start by putting the top bight over a suitable projection, and end by giving the bottom bight a jerk, to tighten, which produces the capsize to prevent it becoming a slip knot. If you do it over a door knob, make sure it is a sturdy one or you may find you have the knot in one hand and the door knob in the other, as well as someone standing over you wanting an explanation.

N King

The macramé wall-hanging in *KM* 147 appears to be identical with one created by Agnes Hansella, a graduate of the Jakarta Institutute of Arts and a self-taught knotting enthusiast.

Geoffrey Budworth

Editors' note: Readers may like to search for 'Agnes Hansella' using eg Google Images. She has produced many 'monumental' works in macramé.

Dear Maurice,

Story behind the picture is that it was hanging on the wall of a small villa in our retirement village.

At first glance I thought it was a dirty big Monkey's Fist. Subsequently, I noticed it was a bit skew-whiff.

Closer inspection revealed it is a 3Lx4B TH, or am I confused?

Frank Brown

We think it's the nest of the very cunning chameleon wasp: Editors

Publications Group

From time to time, the IGKT produces works of knotting interest that would not normally be expected to be published by a mainstream press because of the specialist nature of the content. They are then made available via the Guild Supplies. To assist with this process, the Guild has established a Publications Group which is a sub-committee of the Executive.

The Group currently consists of the following members:

Maurice McPartlan, Editor *Knotting Matters* (UK), Andy Hudson, IGKT Supplies Secretary (UK), Liz Pawson (UK), Jim Caswell (Australia) and Chairman Colin Grundy, IGKT President (UK).

The team has a number of roles, firstly, deciding if a work is to be published by the Guild or not, as well as:

a) Assisting those who wish to have the Guild publish a book or pamphlet.
b) Arranging reprints of existing Guild publications when appropriate.
c) Making available books or pamphlets that are offered for the Guild to sell.
d) Producing an existing publication when the copyright has been offered to the Guild.

Anyone proposing a new work to the Guild, or offering a work produced by another body for publication by the Guild, should submit the manuscript to the Publications Group (preferably in electronic format) at publications@igkt.net.

The Group's Chairman will acknowledge receipt of the submission and give an idea of when the decision will be made.

Labours in LOCKDOWN

by various correspondents

Frank Brown

I am fortunate in that I live in a retirement village in an area sufficiently remote as to be nearly untouched by the plague. However, village management shut down all social activities very early. With most of the village population being OBEs*, we are vulnerable, and the manager did not want to have to answer awkward questions from the coroner. No workshop. No library. No swimming pool. No spa. No Happy Hour. No visiting. No barbies. No coffee club.

Thanks to my emergency service training I had predicted this precautionary action and had laid in a stack of books, but one can't read all day. Thankfully I had knots and knotters to fill the hours. Knots were allowed. Members may recall my note in *KM* suggesting publishing a collection of articles from past issues. Up pops Dr Byfleet and next thing I know I am delving into the intricacies of Turks Heads. As many members know I am not exactly a competent computer operator, so Colin had to carry the majority of the work load, for which I am grateful. I had a couple of projects to work on and a lot of string. One of the projects was the ongoing saga/hobbyhorse/obsession of the knot catalogue.

Made some progress on that but I encountered a problem that is still under consideration. A slightly different rope-making machine needed toying with. The knot stability tester is still waiting to be put to the test. Decorating a simple wooden box with string constructions took some time. A few FEGs and animals were built and distributed.

But best of all was the communication with other knotters thanks to e-mailing and VOIP. Thank you Barry, Charles, Dan, Dave, Dave, David, David, Madeleine, Glenn, Bob, Jim, Maurice, Antoine, Richard, Colin, Colin, Jeff, Darren, Sam, Gareth, Linda, Brian, Europa, Neil, Bruce, Raymond, Robert, Penny, Joe, Eric, Sheila, Des, Yuval, Ling Kay Kau, et al.

* Over Bloody Eighty

Colin Byfleet

As part of his thorough investigation into Turks Heads and Globe Knots, Don Burrhus devised a computer algorithm which created recipes for creating all the standard (ie those that can be tied with a single cord and have a simple under-over pattern) Turks Heads up to 20 for both the number of bights and the number of leads ie 20Bx19L and 19Bx20L.

In addition, he generalized the program to make layouts for other single-cord THs, where there are different, and sometimes non-symmetrical, under-over patterns.

Having rather more time than usual during the recent Covid-19 isolation period, I decided to make some of these non-standard knots as an exercise, since I didn't easily visualize how the patterns would look from the recipes. 12Bx11L seemed a good choice as there were 19 of the unusual patterns and I made those six or seven which looked interesting. Having made those, it seemed silly not to complete the set and so I continued, time still not being pressing.

In his introduction to *The Turkshead Cookbook,* Vol 2*, Don advises care in tying some of the knots, where there are long runs of cord without any crossings. These, as Ashley says, are easy to capsize if not treated with respect.

The 19 variations are shown in this collage, along with the standard version at top-left (1). They are shown just before final tightening, as I think this makes the differences clearer. My own favourites are 2, 3, 4, 7 and 15 whilst the two on the bottom row (19, 20) with the darker blue cord were of the easily-capsized variety and received some scolding whilst being tied.

*Don Burrhus *The Turkshead Cookbook,* Vol.2. 2006 (Currently out-of-print)

J C Moreau

I joined IGKT in April this year. I have been inspired by several YouTube personalities in my knot tying for a few years now, and more recently during our nationwide lockdown. I faithfully followed their examples and, in some cases, modified them to suit my purpose. These people are, in no special order: Brion Toss, JD Lenzen (aka TIAT), Philip LeMasurier, Mikko Snellman, Anthony Parayre (aka MARSALA), Brian and Russell from www.liverpoolshipsandsailors.com, Phil English (aka Fender Maker). I keep a log of all my projects and I'm up to 82 pages so far in a Microsoft Word document. The following are just a small part of what I have done.

Brion Toss and JD Lenzen have spurred me into a frenzy of soft shackles using the 2-strand Button knot and Globe knot key fob. Brion also taught me the method of tying an 8Lx7B Turks Head from a Constrictor knot in one of his books.

MARSALA on the other end, made me appreciate a new kind of Globe knot that I had never seen before, it has 28 facets and is easily made.

Mikko Snellman again came up with knots that I was unfamiliar with (eg the Luzny knot) which was part of a bracelet that I modified as a key fob and also his French hitching around pliers.

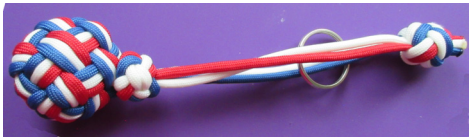
Then came Philip LeMasurier with his excellent YouTube presentations. His knots are exceptional and are found in many of my Bellropes and fobs. I also learned something that I had been doing wrong with a Turks Head for the last 50 years since I first saw it done, from Brian and Russell *Liverpool Ships and Sailors*. And last but not least, fender-making has always been one of my interests and there are so few books on the subject.

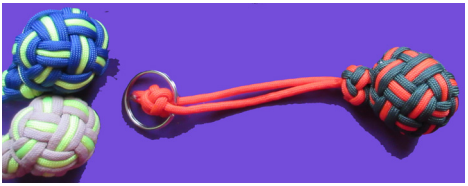
Seeing Phil English (fender maker) working has been a pleasure to watch, since I don't have the space or the material to do any of my own.

Here are some of the projects I worked on during the last 3 to 4 months and who they were inspired by:

Brion Toss:
Soft shackles with 2-strand Button knot and Turks Heads from a Constrictor knot.

Editors' note: We have an IGKT volume The DIY Book of Fenders *by Colin Jones*

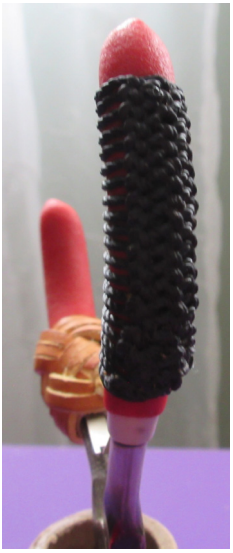




TIAT Globe key fobs

MARSALA: Bellropes and key fobs with 28-facet Globe knot

Mikko Snellman Luzny knot and French Hitching



Philip LeMasurier in these and the other key fobs and bellropes

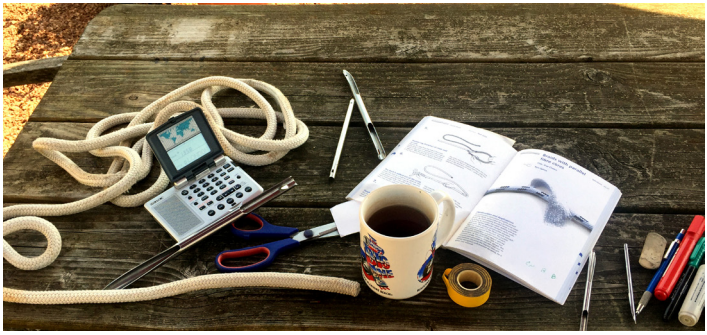
Philip Noble

Thanks for another excellent magazine. You wanted to know what we were doing during lockdown. Well, I have been trying to make a YouTube video every day with a view to giving those confined to home some things to work on. I've titled this 'String, Paper and Stories'. I'm up to number 71 so far, I guess about a dozen or so of them are string/knot related.

They can be viewed at my website www.bubblestrings.com There are also lots of instructions for making string figures on this site.

Gordon Teenan

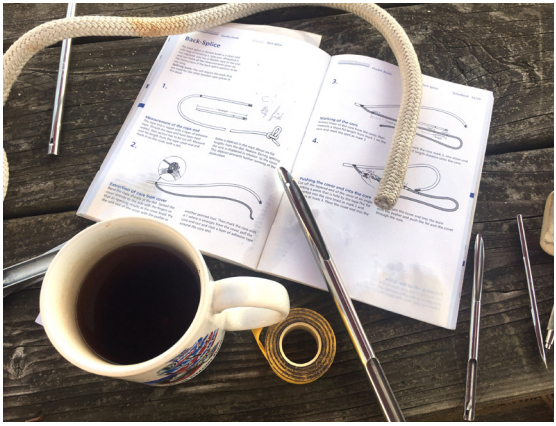
It's lock down, hot, sunny, lunch over, dog walked, what now? Get some rope out, what else? Long time since I did a bit of braid on braid eye-splicing, so start there. First one I ever did was with the assistance of one-time Guild President Percy Blandford's book, long out of print. Didn't make a lot of sense to start with but I got there. Having had another go, for my lockdown task I decided to put together some tips:



You will need some tools, the least expensive is a set of plastic rods, drilled out one end, pointed the other, pretty well all instructions in books show them.

Selma fids are good: cunningly designed, they are in sets of five, in stainless steel. They are a bit dear, but last forever and come with an instruction sheet in the carrying tube supplied.

Worth printing the relevant bit and getting it laminated, it stops the paper getting dog-eared, and saves having to remember the procedure (also allows you to practice in the bath).



The book in my photo is rope-maker Geo. Gleistein's, *Splicebook: The expert's guide for professional splicing* for their own range of ropes.

As ever, be wary of people who say anything is easy; what they really mean is that they know how to do it, and it's straightforward (not necessarily easy). Braid on braid definitely comes under 'straightforward'.

Apart from some marker pens, and a bit of electrical tape plus a few odds and ends you will need a strong point. Door-knobs, bed-ends and cooker handles will not do, you may well end up dragging them across the floor. A 2-ton 4x4 is fine (hand brake on!) but it could make your first splice a bit pricey, so try and borrow one.

When you buy a length of material (get 2 metres at least, enough for one eye-splice), you may be surprised at the variety available, each with different properties and procedures, and some are not straightforward, but just plain difficult, so explain to the seller what you want.

Now here's the thing: you can do it, just follow what the book says, have a bit of faith and get on with it. When you get to the last bit, just go steady, take your time, and all of a sudden it all just slides into place, magic! Great boost for the morale. You can even do a back splice, this is really cool, very neat and tidy, and if you don't know how it's done you, wouldn't guess in a million years.

The last point is that since yachts, small, medium and large are festooned with braid on braid, you will save an appreciable amount of money doing your own splices. You can also make really good dog leads and, given the range available, you could be colour-coordinated every day. One other thing, when you start, don't snag even a single filament, it could ruin your day. So just don't do it!

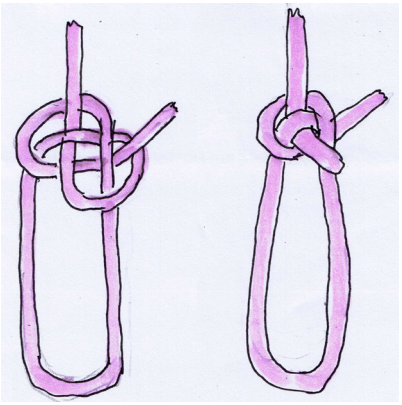
Owen Nuttall

Lockdown Bowline: a fitting name for the predicament we find ourselves in. But there is light at the end of the tunnel. It's the rainy afternoons that I have found frustrating. Although it was one wet afternoon I first tied the Lockdown Bowline in a short piece of climbing rope. I was attempting to tie a single Bowline: it had to have as few tucks as possible and be very secure but easy to untie. I think that the Lockdown version more than meets these criteria.

I have never seen this version documented before, which I find surprising.

I have fond memories of the single Bowline. I first learnt to tie it in the Cubs many years ago, by following the well-known mantra: up through the rabbit

hole, around the tree and back down the rabbit hole. I have even taught it this way, along with many others. So I thought I would modernise it for the Lockdown Bowline, by calling the working end the rabbit.



The rabbit goes out of the front door, around the tree, down through the back door and straight out of the front door.

Go on, tie the Lockdown Bowline.
I hope it will make you smile.

Ewa Thormählen

In these crazy times I have much more time to tie knots, I haven't been this productive in years!

I have just finished covering a bottle in macramé with Coronavirus in mind. The yarn is cotton, 12/6, about 0.5mm thick. The bottle has 360 virus 'knobs' and it is topped with a macramé crown . There is a special bottle light so it works like a beacon in the dark!

Greetings from Sweden. ewathormahlen@gmail.com

Tim Field

I made good use of the *KM* pull-out project sheets, in particular Theo Slijkerman's four-strand square sinnet. I made about a dozen key-fobs and one with a loop instead of a key-ring.

If you pass through Widegates in Cornwall (UK), you might notice the one that is attached to my brother's front-door bell!

Bowline: the Stolen Knot Name

by Robert Birch

Bow means curve. Securing the forward curve on the weather side of a square sail was very important to allow sailing closer to the wind. The technology was pioneered by Vikings. The Old Norse name for 'a line from the forward curve of a sail' became 'bowline' or its equivalent in the language of sailors throughout Europe.

Bowlines were attached in various ways, usually involving splicing or seizing for security against slack-shaking by the sail. The commonest method on tall ships was a bridle attached by seized clinches (*ABOK* #1130) to multiple cringles near the middle of the sail edge. In most languages (other than English) this clinch is called the bowline knot (*noeud de bouline, bulienftich* etc). In 17th century England it seems to have been known as the 'Bowling or Bolin knot'.

Viking longboats had identical ends. Though the means of propulsion and steering established a front and back end, the Vikings did not use 'bow' for the front stem. This nautical use of 'bow' emerged much later, probably from German or Dutch.

Bows and arrows are much older than sails, and among the knots used on primitive bowstrings was the one called (in modern English) a Bowline knot (*ABOK* #1010). English sailors in the 18th century probably adapted the name 'bowstring knot' into the more nautical-sounding 'bowline' knot.

noeud d'agui
Interlocking bowlines showing front & back of the knot

Even though it was probably never used except in emergency on the bowlines, the versatile and jam-resistant fixed-eye 'bowline knot' has many uses aboard ship. Some of them are reflected in their names in all European languages other than English, such as *palstek* (pile hitch), *leibknoten* (bodyknot), *lifknop* (lifeknot), *noeud de chaise* (chair knot) and even *Nodo e cappio del Barcaiolo* (boatman's slipknot). Other ancient names such as *noeud d'agui* (used today mostly for the Hawser bend, comprising interlocked *noeuds de chaise*) are of uncertain derivation.

For a fuller (referenced) analysis, see the article of the same title under 'Knotting' at http://members.iinet.net.au/~jorobbirch Perhaps further information, especially evidence on the first use of 'Bowline knot' will be shared through *Knotting Matters*.

A Möbius Challenge

by Geoffrey Budworth

Since this quirky topological shape (which has only one side and a single edge) was first identified by the German mathematician and astronomer Augustus Möbius (1790-1868), it has become the subject of much scholarly research and writing, as well as an item of novelty merchandise, and a favourite party-piece with amateur conjurors; see *ABOK* Chapter 33 (Tricks & Puzzles), *ABOK* #2591-2592. Now the renowned sculptor John Richardson has incorporated an overhand knot to produce a classic trefoil design.

Fig. 1

His elegant creation is displayed on the 2nd floor of the School for Infomatics, at the University of Wales, in the UK cathedral city of Bangor. But Guild members Jeff Wyatt and the late Charlie Smith led the way over 10 years ago in tying plaited trefoil layouts.

Fig 2

Here's one of mine, but devotees of the peerless real knot theory publications by Georg Schaake and John Turner are now able to tie Möbius band Turks Heads. So, can anyone combine both techniques to tie a knotted Möbius trefoil (or has anyone done it already)? If so, please let's see it here in the pages of *Knotting Matters*.

It has the appearance of an 8-strand square plait, woven over 2/under 2, like those macho leather dog leads for macho dogs. But I tied it with a single strand, while incorporating the overhand knot. Some trial-and-error was involved.

To describe the method is beyond me now. Step-by-step illustrations would have to be a series of painstakingly detailed line drawings, over several pages. A lengthy video would work.

Best, as always, is sitting alongside an effective teacher (alas, no longer me). Contact Jeff Wyatt, who had a better grasp of the technique than I ever did, if you're looking at this for a future project.

A Fishy Knot

by Richard Hopkins

There has been an article in a previous edition of *KM* (134, pp14-16) of the hagfish which can tie knots in itself to wipe off the slime that it generates.

I had always thought that this knot would start by moving the head and forming a Thumb knot which then slides down the body. This may happen, but I was wrong about the organism's knotting ability and recently discovered a thesis by William Austen Harvey in 2017 which told me much more. Before I go into the knots, you should know more about the hagfish.

Hagfish are rather unattractive eel-shaped marine fish that are known for producing slime. They have a skull but no vertebral column, are jawless and are similar to hagfish from 300 million years ago. There are about 76 species which all live in cold water on the floor of the ocean.

Features of interest are a very loose fitting scale-less skin, a lack of both true fins and teeth. Instead they have a pair of horizontally moving structures with a series of rasp-like projections although they do not grind the food like a lamprey. The various species range in size from about 7in (18cm) to 4ft (120cm) and are found in both the Atlantic and Pacific oceans. They have a 'distinctive' flavour, some being eaten in Korea and Japan. The third Wednesday in October is Hagfish Day but generally they can be a nuisance to trawler-men as they get dragged up in large numbers during deep-trawling operations and start eating the rest of the catch. The skin can be used to produce a hard-wearing leather for eel-skin belts and bags.

Regarding the slime, it is a protein-based jelly-like substance made up of strands that are stronger than Nylon, thinner than a human hair and very flexible. When these skeins of slime come into contact with seawater the glue holding them together dissolves and the slime expands rapidly, filling the mouth and gills of an attacker and allowing the hagfish to escape.

One fish is supposed to be able to fill a 5-gallon bucket in only a few minutes. A car carrying a load of hagfish was involved in a road accident which prompted the fish to exude slime with impressive results (see p23).

The slime is being studied with the view to synthesising it (to prevent stress to the fish) for use, amongst other things, in protective body armour, helmets, airbags, and to add lightweight strength and flexibility to car parts, as an eco-friendly alternative to petroleum-based products.

I was also amused to learn that the hagfish sneezes when its single nostril get filled with slime.

To return to the knotting.

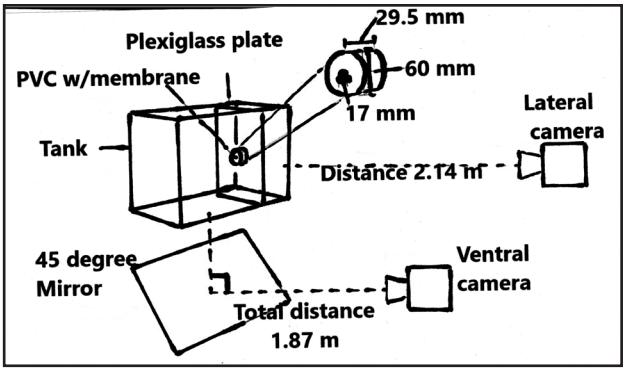
In the thesis, it is observed that knotting behaviour has also been seen among four species of water snake, probably to aid skin shedding or possibly to remove parasites. They generally use Thumb or Figure Eight knots.

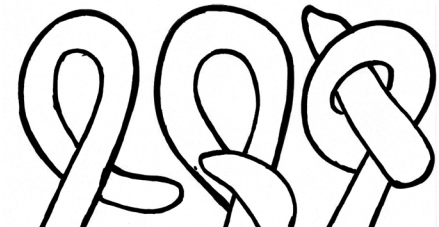
Moray eel species also use thumb knotting to break up chunks of food or to compress it.

Having no teeth or jaws, the hagfish cannot bite off chunks. Instead, its keratinous rasp latches into the meal, and a knot is then formed from the tail end, slid along the body and used as a leverage point so that the food is ripped free for swallowing.

The absence of fins and vertebrae helps knotting, and the loose-fitting skin allows for a degree of slippage. The very smooth skin also helps and the slime may act as a lubricant when needed.

To study the behaviour, the head of the lightly-sedated fish was placed in a hole in a membrane inside a baited plastic tube at one end of a fish tank and, on recovery, was filmed with high-speed cameras from the side and below. The restraint device ensured that the cameras were aimed at the right place.

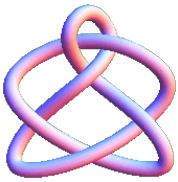




Body crossover *Tail wrap* *Tail insertion*

A series of measurements was taken of the crossover angle of overlapping body parts, the radius of the loop when the parts crossed over and the overhang of the tail before it began to wrap around the body for the next movement. These were later analysed statistically which completely lost me.

There was a lot of discussion on the way the hagfish was able to manipulate its body to achieve the knots. Three distinct motions were required to form them: cross-over, tail-wrap and tail-insertion. Two rules became apparent - firstly the knot starts at the tail end then moves up to the head, and secondly each move alternates in its handedness. This means that the next movement in the knotting sequence must change direction and side of the body, otherwise the knot will not form.



The hagfish tied the Thumb, Figure Eight, and the Miller Institute knots. This last is the six-crossing prime knot named from the logo of the Adolph C and Mary Sprague Miller Institute for Basic Research in Science at the University of California, Berkeley

The knots are formed from the tail end and slide along the body to a point where they can gain the necessary purchase to assist escape. In a few instances, the wrap around the body was sufficient to aid escape without actually being tied in a knot. At other times, vigorous wriggling of the body was sufficient to get away from the restraint.

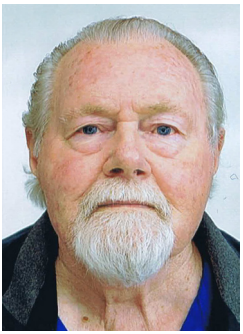
It had been suggested that the more complicated knots might occur more frequently as there is less internal stress at pinch points within the knot, but in practice the Thumb knot, followed by the Figure Eight were the most common. This makes sense because the loop into which the tail is inserted is larger in the Thumb than in the Figure Eight knots.

For anyone wishing to know more about this revoltingly interesting fish, there is a number of YouTube videos showing the knotting and also the production of slime.

This car was involved in an accident while transporting containers of hagfish. Distressed hagfish make a lot of slime.

Deck Boy to Sling Designer

by Bill Bleakley



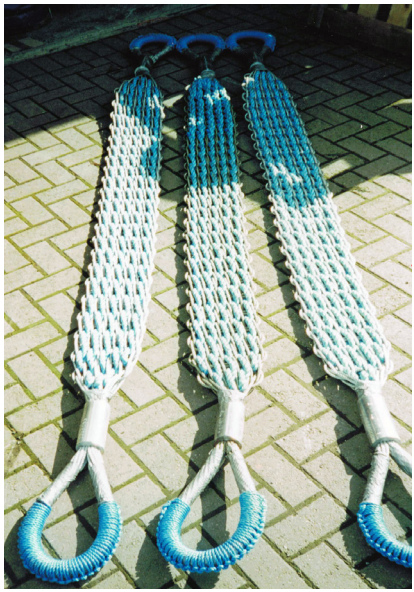
After Sea Training School, I joined the Merchant Navy between 1962-1976, first serving as Deckboy and making my way through the ranks as Boatswain's Mate to Deck Petty Officer. I sailed on many types of ships, such as General Cargo (Port Line Blue Star). They were all well-maintained ships with good crews and a lot of maintenance needed with many derricks for heavy lifting. Unlike container ships today, we had crews of 40-50. Large cargo vessels in my day would have been 10,000 gross tonnage, now they have an estimated gross tonnage of 228,000 and a crew of 25.

The ships I was on were mainly bulk carriers with cargoes such as iron, sailing the world's oceans and seas waiting for orders to go anywhere, to load items such as coal. When they were loaded, there was no set time as to how long you would be aboard, and sometimes you could be away for months at a time. We travelled the world, often stopping off at ports for short periods. Because of the size of the tankers I was on, for example, of 195,000 to 313,000 tons carrying oil to Vietnam during the war, they were never allowed to stay in port for long.

Due to family commitments, I left the Merchant Navy. Those days at sea are still something I talk about very often with my children and grandchildren, as these were some of the best days of my life. I got to travel the world, doing a job I loved at a young age. It was during my time at sea that I began to have an interest in rigging and knotting.

I obtained my rigger's card and found employment in a small rigging and sail-maker's loft. From there, I went to the local gas plant. A vacancy became available for a rigger on the Belfast Harbour Commissioners (BHC) which I applied for successfully. After a few years I was promoted to rigging foreman. We maintained the harbour cranes and also the cranes on the dry docks, the pumping stations and floating cranes. On the left is a photo taken in my younger years, splicing a crane wire along with a colleague.

There was plenty of hand-splicing in the harbour, and it was while I was there that I began working on my own slings and had a passion for it - it turned out that the BHC diving team needed more flexible slings and their requirements were different to those of the floating cranes. An advantage of working in the harbour was that I got to know the manager of Harland and Wolff, and my sling samples were kindly tested to destruction on their 100 tonne horizontal test machine with great results.



Three flat slings

Patent Sling non ferrules SWL 15t

Patent sling with protection ropes

I then began the process of applying for my patent. This whole process took about 3 years, as you had to apply for a grant, provide drawings, receive 'patent pending' before it was finally accepted.

My patent, the Leno woven sling, had four types of terminations:

1 Ferrule splice each end

2 Ferrule one end none other

3 Twin ferrules

4 Non-ferrules

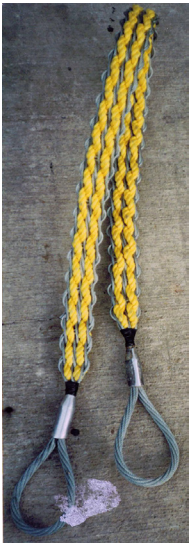
On Safe Working Load (SWL), not only were destruction tests carried out on Harland and Wolff's test machine, but they were also overseen by an independent examiner.

The tests were done in three different positions, Straight Pull, Basket and Choker, once again, breaking loads to destruction were very good. This gave me the information I required for SWL.

Nylon mooring strop

Leaving the secure employment at BHC was a hard decision, especially with a wife and six children at home. My small rigging shop had 25, 300 and 500 tonne presses for mechanical splicing along with a 50 tonne horizontal test machine.

We covered a lot below the hook: chain and web slings, splicing, examining and testing.



Patent Type 1 sling

The bulk of work was specialised slings, including my patent. One drawback was that they were labour-intensive and time-consuming when you consider how many standard slings you could complete in the time taken for one woven 10-tonne sling, 5 metres long with no ferrules, this is where the mechanical assistance would have been a benefit.

I sold my company about 14 years ago, but I still have my patent which I have not sold on to anyone.

My sons still work in this field and, now in my mid-seventies, I enjoy working with slings, making knot boards and dog leads, and still have a little workshop where I keep busy, as it will always be my passion, even during retirement.

Editors' note: More images of Bill's slings and other work can be found on the website

Prusik Handcuffs

by Richard Hopkins

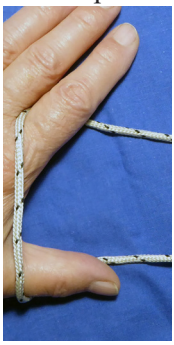
The article about the Single line Prusik knot in *KM* 147 was interesting although I am sure that the application described is not the only time it has been tied in a single line*.

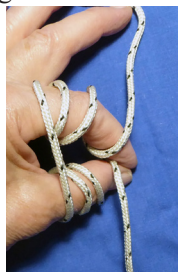
It reminded me of the 'field expedient handcuffs' (American Army terminology) used before Plasticuffs were so common, or if the Plasticuff supply was insufficient for the needs of the operator and a large number of prisoners was anticipated. I was first introduced to these 'handcuffs' in the late 1960s, so the idea has been around for a long time, which is why I am sure the single line Prusik has been used elsewhere.

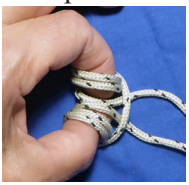
A supply can be made up in advance and carried easily to the point of use. In an emergency they can be made rapidly from a prisoner's bootlaces.

They are very similar to the single cord knot but both loose ends are used, going in opposite directions, to make a one-size-fits-all handcuff that is pulled tight and secured with a further knot in the long ends.

The Prusik can be tied in any convenient way, but I like to wrap the cord around my thumb and first finger, usually three times. Then by touching the tips of the finger and thumb together the loops are in the correct orientation and can be faired up before taking one long end and threading it through the loops.







The other end is similarly fed but in the other direction and the knot dressed tidily.

**Editors' note: We have received several letters mentioning other uses of a single line Prusik knot.*

Handcuffs of any sort should not be relied upon to keep a prisoner secure, as many action movies can testify. It means that prisoners need to be watched constantly.

Heavy duty cable ties have, in many instances, replaced the more expensive Plasticuff even though one version came with a keyhole for a normal handcuff key to allow for re-use.

Experimenting with Kumihimo

by Mac Mackenzie

Just reporting on my most recent kumihimo experiments. I'm most proud of the Cherry Blossom braid but also super-excited about the *Kikko* braids. Both projects were inspired by tutorials by Claudia Wollny, the former from YouTube tutorial (https://www.youtube.com/watch?v=j5qED7SJTi8&t=45s) and the latter from her excellent publication *(The Secrets of KIKKO: With 85 Variations of the Famous Tortoise Shell Pattern for Braiding on the Marudai*. Wollny, Claudia Edition, 2020

ISBN 3948315019, 9783948315016). Claudia gives a thorough explanation of how to approach the basics of any kumihimo project. I highly recommend it.

This is my first time with kumihimo, but I have had a fair bit of experience with the solid sinnet section of *ABOK*. The solid sinnets are very much number/plan oriented, but I'm finding that the kumihimo is definitely more rhythm and symmetry. For the solid sinnets I always used a braiding table, the working surface of which is around chest height, but for the kumihimo the *marudai* is much shorter which allows me to work in a much more comfortable seated position. This surface of the marudai is called the 'mirror'. I've not directly researched this but I'm guessing the term 'mirror' is used because, as you are forming the braid, each side of it is worked as a mirror image of the other.

Like Ashley's solid sinnets, kumihimo requires a counterbalance to offset the weight of the '*tama*' (bobbins) that the working strands are wound onto on the outside of the marudai. This counterweight is usually around 45% of the combined weight of the tama.

I treated this as a project within a project and decided to make a diminutive 'ditty bag' from canvas and flax twine. I completed this with some stitched grommets (*ABOK* #3524) and some Chinese eight-part Button

knots from hard-laid cotton cord to attach an S-hook to. This little bag was then filled with lead shot (my first and last gun-shop purchase) to the required weight.

I figured it was the best way to fit as much weight as I could into the smallest space (about 2kg required for the Kikko). Strangely, when I made a drawing of the bag before I started it, I drew it to pretty much the exact size I ended up making it. It was obviously meant to be.

For each of these projects, I used Mercerised Egyptian Cotton (Ne 20/2 (Nm 34/2). For the Kikko projects the work is comprised of 32 warped strands. Each of the warped threads was comprised of 28 cotton threads.

First Kikko front working

First Kikko back working

For the Cherry Blossom project, the work comprises 24 warped strands. These strands vary in thickness from just 10 threads of cotton up to 84 threads for the four main fuchsia ‘blossom’ strands. The variance in thickness giving the overall 3-D look to the finished braid.

The two Kikko designs I have made both follow the same 16-cycle path repeatedly (the same 8 moves repeated 16 times). After the 16 cycles all strands return to their original position and it’s time to repeat. For the yellow/green/black Kikko there is a symmetry (left and right) to the original positioning of the

32 strands, so the same pattern is repeated twice within the 16 cycles.

For the red/blue/platinum/orange Kikko the pattern does not repeat within the 16 cycles. For each of these projects there is a difference in design between front and back of what is a flat braid.

Second Kikko working

Second Kikko braid

The Cherry Blossom braid is a little different in that there are only two sequences to follow. Each sequence is completed twice for all the 24 strands. The result is still a flat braid, but creates a 3-D effect which is the same on front and back.

For the purposes of the photograph, I decided to form the Cherry Blossom work into a 3Lx5B Turks Head, and was quite pleased with the result.

The pictures show both the completed work and general layout of the warped strands on the marudai/mirror.

Cherry Blossom braid

There were many enjoyable hours work, and a lot of unbraiding to fix errors when spotted. It turns out that to learn kumihimo forwards, it is also a good idea to learn it backwards. Please refer to the referenced YouTube tutorial and *The Secrets of Kikko* publication for a thorough explanation of everything involved.

Knot Carving in Stone

by Elizabeth O'Kane

A Chinese Button knot sculpture

The idea for this sculpture came about over dinner on a sunny Dublin balcony in the summer of 2019, when David and Sue Pepper brought my sister a beautifully wrapped and knotted gift. As a beginner rock climber, I am interested in knots, and as a sculptor I am intrigued by form. The evening turned into a display of knot tying, and I immediately thought the button knot would make a fascinating study for a stone carving.

First step: what material?

Usually I sculpt in clay and cast my work in bronze, but for this project I decided to jump in at the deep end and carve in stone. Clay is much easier than stone: clay-modelling is a process of addition, in which the artist can easily add and remove material; stone-carving is a process of subtraction, and so much less forgiving of mistakes.

I envisaged my finished carving in a dark-coloured stone that would show the texture of the rope. Kilkenny Blue Limestone, which I've carved before, is a native Irish marble, made of fossilized sea and fresh water creatures from hundreds of millions of years ago. It is pale blue-grey, which darkens to a black when it is wet or polished. Stonemasons would describe Kilkenny Limestone a 'soft' stone, compared to granite for example, but I usually work more comfortably carving into travertine and alabaster, so I find it quite a hard stone, and carving it is really quite a physical workout. My previous stone carvings have been of animals and torsos. The knot was rather an ambitious departure, the shape being fairly complicated.

Next question: what size?

The sculpture size would be limited by the weight of stone I could carry and manoeuvre. With the advice from McKeon Stone in Stradbally, Co. Laois, I ordered a 40kg block of Kilkenny Limestone, 30cm in diameter.

I requested McKeons to pre-cut the stone as a sphere which greatly helped keeping to the knot's overall shape. My plan was for the sculpture to rotate, so McKeons also drilled the stone to house a metal pin, which allows the finished sculpture to be turned on its plinth by the viewer.

Luckily, I had obtained my block of stone before Covid-19 shut down the country. This sculpture would become my Covid lockdown project, carving each day in my garden workshop.

David had kindly sent me a variety of knots tied in different materials, and I made some drawings to figure out the logic of each knot's structure. A hemp, doubled, Chinese button knot was my final model. I numbered each of its eight visible sections with coloured stickers.

I drew out the corresponding eight sections onto my stone sphere in coloured crayons. Initially it looked like a soccer ball.

I set to work cutting around and into the eight sections with chisels and hammers, all the while trying to show the logical direction and structure of the rope.

When carving on my workbench (or 'banker') I prop up the stone on sandbags to protect the underside of the stone from heavy blows. From time to time, I lifted the sculpture up onto its pin and rotated it on a temporary base, standing back to check the balance and flow. Forty kilos weight was just about my limit!

I was inspired throughout by geometric shapes and stone knots carved by British artist Peter Randall Page (*see KM* 134, *cover - Editor*), whose sculptures look so perfect and effortless, and by the Renaissance sculptors Gian Lorenzo Bernini and Giambologna. I pinned images of their work onto one studio

wall and placed a mirror on another wall to see my sculpture from several angles at once.

Tools of the trade

Each carving session starts by donning my steel-capped work boots, gloves, eye goggles, mask and headscarves to protect from flying stone chips. My trusty cocker spaniel Pippa sits by my studio door and occasionally comes in to check on progress and maybe steal a stone offcut to chew on. I tend to carve with small and medium-sized pneumatic air hammers, rather than hand hammers, my decision-making and carving is faster this way. When it came to showing the texture of the rope on the stone, however, my 'claw'-pointed chisels were perfect for suggesting the direction of the strands of the hemp, switching to smaller, finer chisels for the final texture.

Every session ends with brushing stone chips from table and floor into an ever-mounting pile in a bucket, before falling into an exhausted but satisfied heap. The routine was welcome during the strange days of Covid-19.

Every day I photographed the progress and downloaded the images to my laptop. It's helpful to see the progress, switching from 3D sculpture to 2D image on screen.

I had a deadline, to exhibit the work at an outdoor sculpture exhibition at Ballymaloe House and Gardens in Co. Cork, an exhibition organised every year by former vet, Richard Scott.

As the exhibition date loomed closer, my daily working hours became longer and more pressured.

The carving took about eight weeks, in all. About a quarter of the stone was

removed in the process, to reveal the shape of the knot, the finished sculpture weighing in at 30kg.

I coated the surface with an Italian wax which darkens the stone and gives a wet look.

I managed it in time and sent the knot off to County Cork to join forty other stone carvings at Ballymaloe House for the months of July and August. It was a really fun project to work on, and I'm pleased to report some great feedback.

(We think it's a triumph. Editors. Elizabeth's CV is on the IGKT website)

Elizabeth O'Kane

Originally a translator of French and Spanish, I changed career in my late twenties to follow my passion and become a full-time artist. I am largely self-taught, but have undertaken part-time studies at the Art Students League of New York, and at the Florence Academy of Art in Italy. I'm fortunately able to continue to indulge my love of cycling and dogs.

I am now a sculptor and painter based in Dublin, Ireland. I divide my time between fulfilling commissions for portrait and figurative sculptures (usually cast in bronze), carving less formal stone sculptures (always more abstract than my bronze work), and also painting architectural subjects and cityscapes in watercolour. I am best known for my six-foot bronze of Irish tenor John Count McCormack in Dublin's Iveagh Gardens. Collectors of my work include The Irish Embassy in Washington DC, The National Library of Ireland, Shannon Airport and The International Rugby Board. http://www.elizabethokane.com/

‘How to’ Tie a Knot is in Your Brain

kindly provided by Carnegie Mellon University

Report of Research at US Center for Cognitive Brain Imaging

Although we often think of knowledge as ‘knowing that ...’ (for example, knowing that Paris is the capital of France), each of us also knows many procedures consisting of ‘knowing how’, such as knowing how to tie a knot or start a car. Now a new study has found the brain programs which code the sequence of steps in performing a complex procedure.

In a recently published paper in *Psychological Science*, researchers at Carnegie Mellon have found a way to find and decode the procedural information required to tie various knots, with enough precision to identify which knot is being planned or performed.

To reach this conclusion, Dr Robert Mason and Dr Marcel Just first trained a group of participants to tie seven different knots, and then scanned their brains while they imagined tying, or actually tied, the knots while they were in an MRI scanner. The main findings were that each knot had a distinctive neural signature, so the researchers could tell which knot was being tied from the sequence of brain images collected. Furthermore, the neural signatures were very similar for imagining tying a particular knot and planning to tie it. Dr Just noted that “Tying a knot is an ancient and frequently performed human action that is the epitome of everyday procedural knowledge, making it an excellent target for investigation.”

The research project was funded by the Office of Naval Research. While naval cadets frequently use nautical knots and naval doctors tie knots in surgical procedures, naval personnel are required to master many other types of procedural skills. Understanding how the brain learns and represents procedural tasks is an important part of the science of learning.

The machine learning algorithm the researchers used succeeded by first processing the fMRI data from trials in which the participants mentally tied a knot such as a bowline or a sheet bend knot, and learned the association between each of the knots and their respective neural signatures.

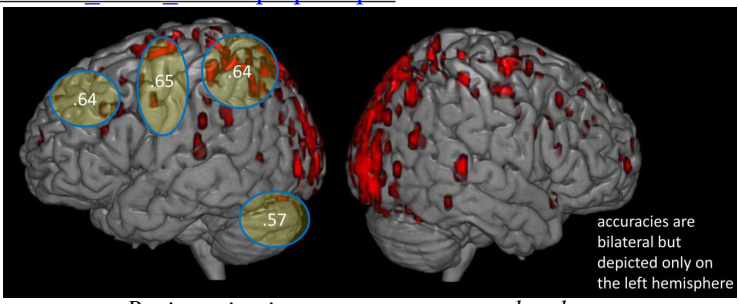
“Once we identified the neural representations of the procedures of how to tie each specific knot, we were able to predict which knot they were about to tie before they started tying it”, said Dr Mason. “That was possible because we have a plan for tying each knot, a plan that becomes activated just before the actual procedure is executed.”

What distinguishes this finding from previous ‘brain decoding’ studies is that ‘knowing how’, involves a particular sequence of actions executed over some time period, and not just a static snapshot of ‘knowing that ...’.

In 1951, Harvard neurophysiologist Karl Lashley proposed that a complex act like playing a tune on a musical instrument requires a linkage between the successive steps involved in the procedure; he hypothesized that it requires a higher-order mental structure or plan for organizing the sequence of steps. These new findings now confirm the existence of such higher-order mental representations of procedure, and they furthermore identify which procedure is which.

The ability to identify the neural representation of a procedure may be useful in developing highly effective instructional techniques and in developing brain–computer interfaces that translate a mental procedure into a robotic procedure.

The article is available here: http://www.ccbi.cmu.edu/reprints/Mason_Just_PsychSci-2020_knots_CCBI-preprint.pdf



Brain activation patterns represent the plan to perform a specific knot-tying procedure.

Geelong Meeting 2021
Photographic Exhibition

IGKT members are invited to submit interesting photos of their own or others’ knot- or rope-work

Send them by e-mail (JPEG or similar) along with your name to:

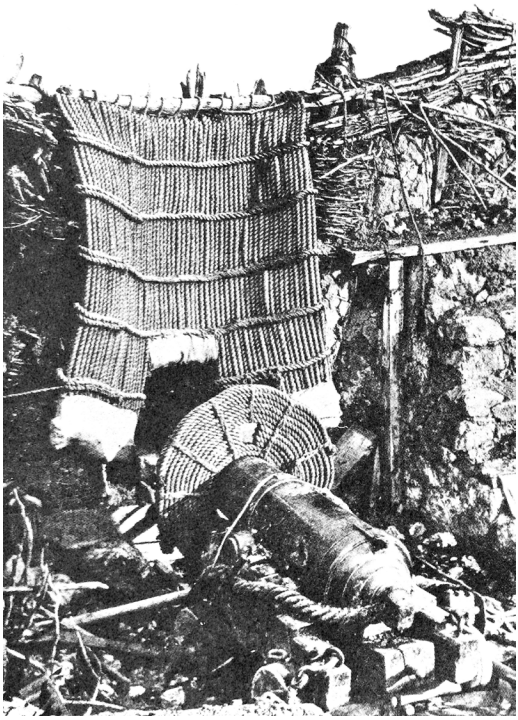
frankcbrown237@gmail.com

Selected photos will be displayed at the meeting and the most popular photographer will receive a book prize

Ropework in the Crimean War

by Geoffrey Budworth

The Englishman James Robertson (1813-88) was Superintendent and Chief Engraver at the Royal Mint in Constantinople, as well as one of the first war photographers. This is just one of his memorable images.



It is a scene resulting from the British military's breach of the Great Redan[1] of 1855-6 during the Crimean War, at the same time as the fall of Sevastopol (English: Sebastopol) led to the French capturing nearby Malakoff.

KM readers' eyes will of course be drawn to the rope mantlet (more commonly made of wickerwork) and the circular shield around the cannon's muzzle, presumably to protect the gunners from incoming projectiles or flying debris.

The hanging mantlet, if made of four thicknesses of eight-inch rope, and weighing 400 pounds, would have been missile-proof at 400 yards, but occasionally penetrated at 350 yards. Using 1½in rope was only proof at ten yards. Both afforded protection for men working with rammers and sponges at the muzzle of the gun, while the circular shield was presumably to protect those firing it.

The British Army of the late-Victorian era also kept up its ropework training as the following printed order of the *Instruction in Military Engineering* – Volume 1, p183 dated 1st January 1870[2] confirms:*'... the greatest pains should be taken by the instructors to see that their men can make each of the knots here described in all situations.'* What those knots were I'll report in a follow-up article.

1 Redan: a V-shaped salient angled towards the expected direction of attack

2 Royal Engineers' Museum, Library & Archive in Gillingham, Kent UK

Pan Chang: Veins and Voids

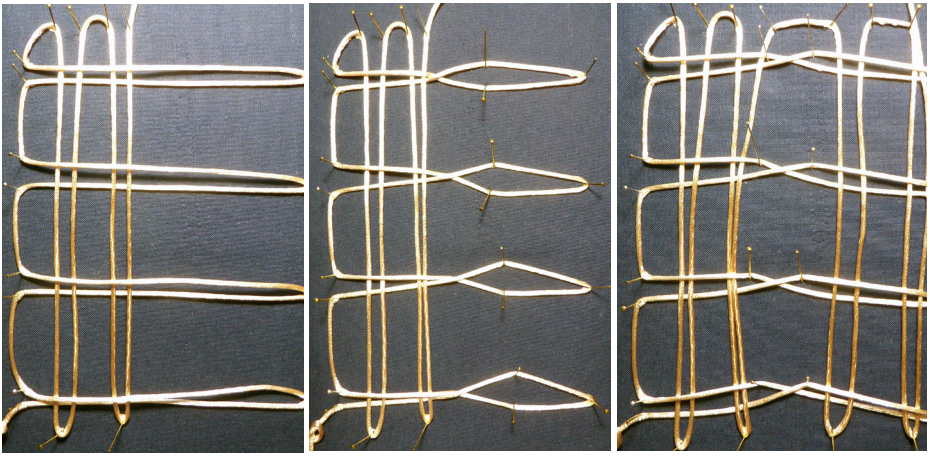
by Europa Chang Dawson

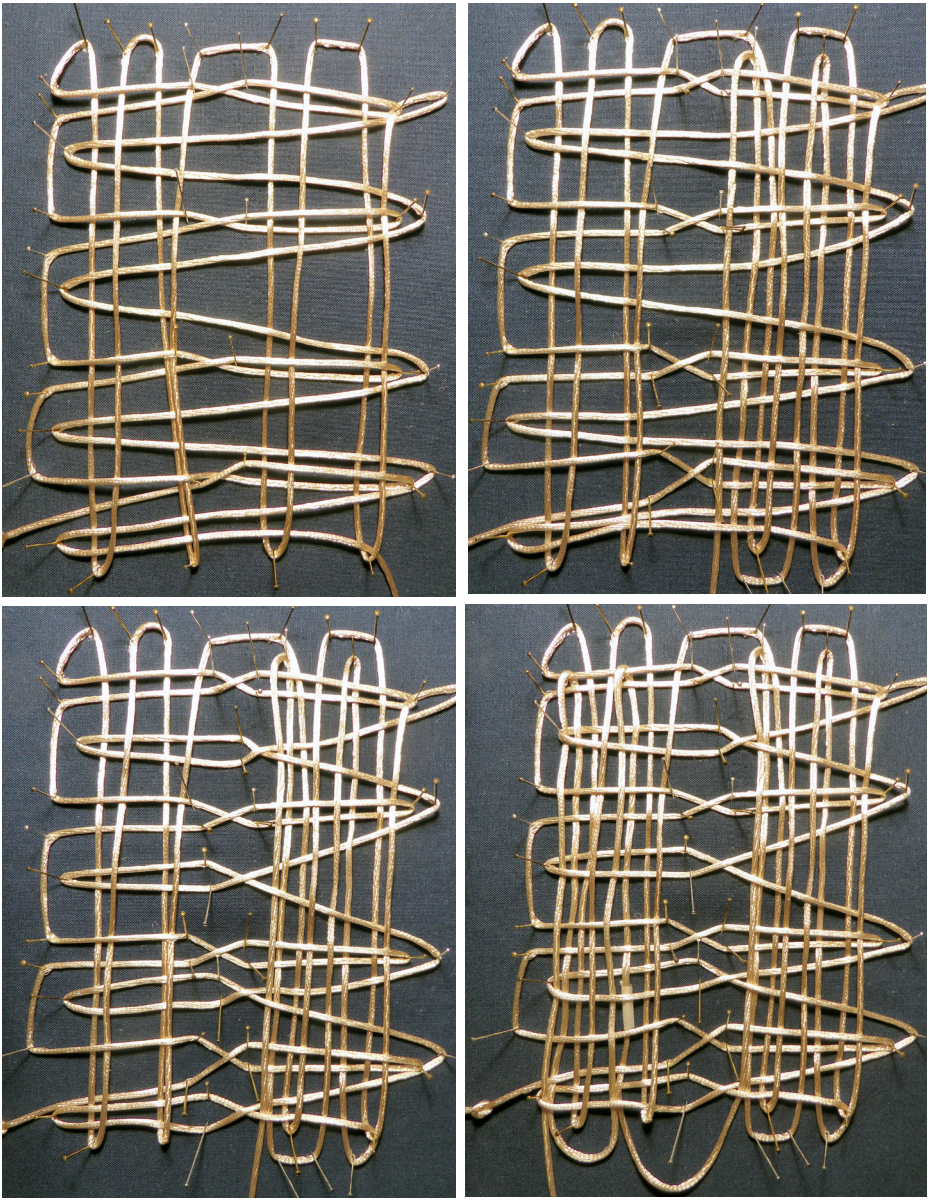
Veins

So far, every Pan Chang tackled has been in silhouette form making an envelope for a single space between the two layers. Sometimes, though, the enclosed space needs to be divided – for instance, when a pair of prized earrings is to be stored safely until it is the turn of the next daughter to wear them – and then a Pan Chang knot is tied with a partition down the middle. This gives the 'puffy' look that occurs when a finger-bight has been twisted unintentionally in tying a classic Pan Chang knot, but this time the twists are put in deliberately. The ones shown in the photos (p40) have not been pulled up, so that the twisted bights may be seen clearly; it is worth experimenting with the direction and number of twists to find the arrangement best suited to the design you have in mind. A short vein in the middle of the knot is also possible, and this would work well for holding a chain so that it does not tangle while in transit.

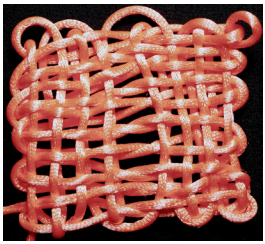
To tie a veined Pan Chang, demonstrated here with a 4x4 Pan Chang I find it easiest to make twists in the first and third sets of bights, each set being twisted midway through the second and fourth sets. [cf *KM* 138].

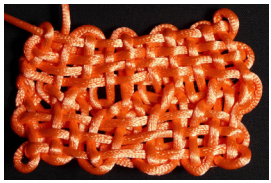
The knots will pull up more evenly if all the twists lie in the same direction, but then the knot itself will show a tendency to twist. If these knots were being tied as containers for precious items, a silk





band between 5-20cm width would have been used depending on the size of the piece, as the crumpled silk gave extra padding and helped seal the interstices of the weaving. In family lore, a carved jade clasp was hidden in a saddle bag of dirty laundry when an ancestor travelled through bandit country in 1906. However, the knot is not particularly pretty.





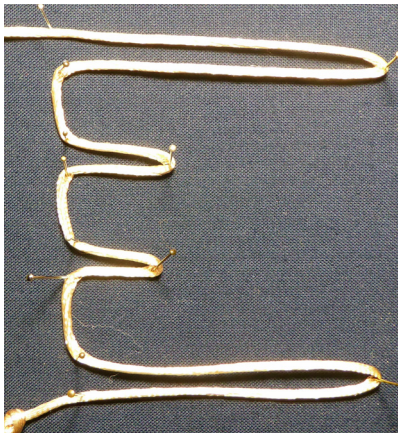
Two other examples, untightened

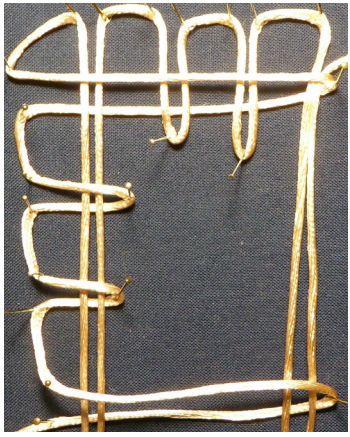
Voids

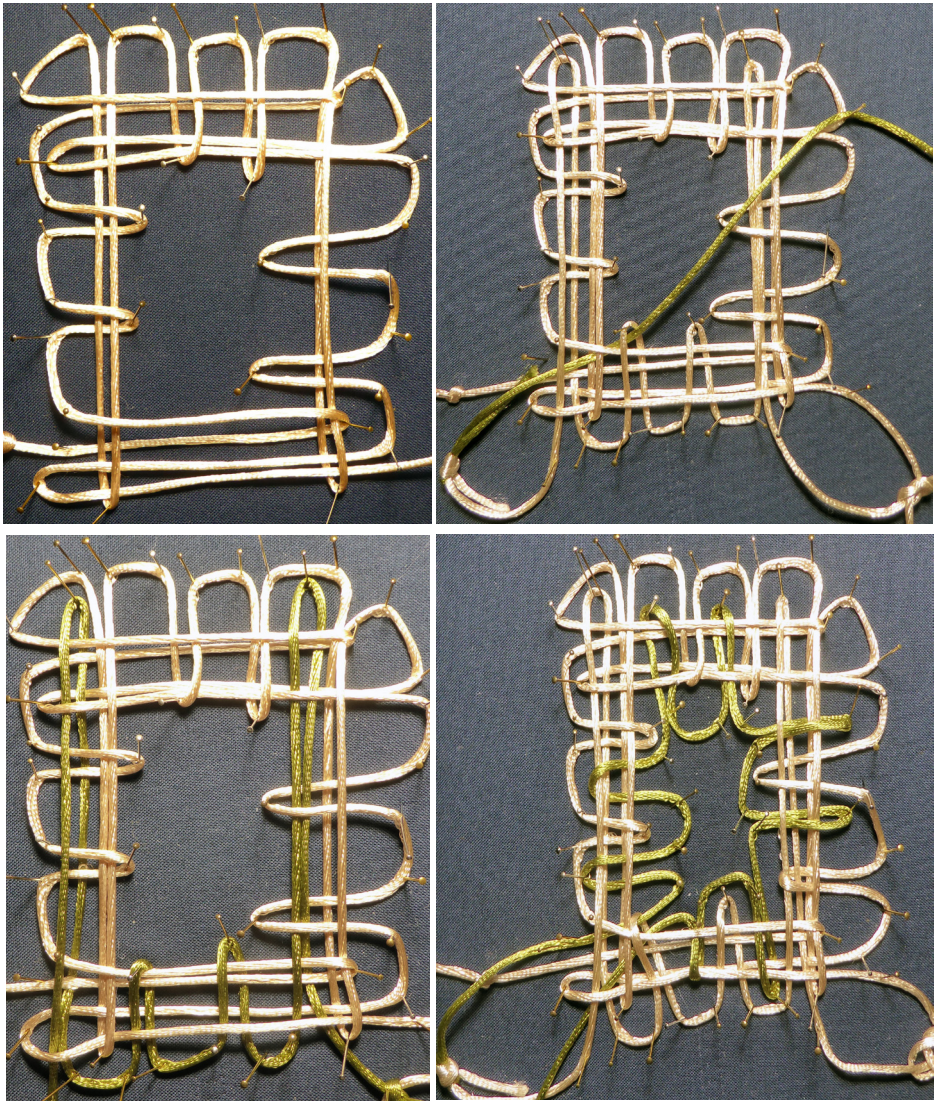
By 1800, China was in economic decline and many Chinese men were travelling overseas to find work. So many were in SE Asia that, by 1830, the clan houses were well-established and the custom of giving a new father a length of red thread (cf *KM* 141) came into being. To ensure that the men returned to China, they were not allowed to bring their wives.

At this stage, elementary education was free but not compulsory for male children, (a lucky girl would be permitted to attend school by sitting outside the open door or behind a screen) so many of the men who left to find work abroad were illiterate. Even if their families could find and pay for a letter-writer, the men did not expect letters, but sometimes small gifts could be sent with the next man travelling from the same village. It was at this point that the void in a Pan Chang knot took on significance.

The ideogram for 'return' is so that a knot of longevity with a central void becomes a double wish, for health while abroad and a safe return. Such a knot could be slipped in the pocket of a jacket sent out with the next traveller, and provided a constant reminder of home.







The demonstration shows how the knot is laid out for tying. Some people prefer to use a single length of cord, possibly because the continuous length has a superstitious association with the length of days, so it is shown here how to feed the cord through the central space.

Personally, I prefer the use of a second cord as being structurally sound. Finished samples of both methods are shown.

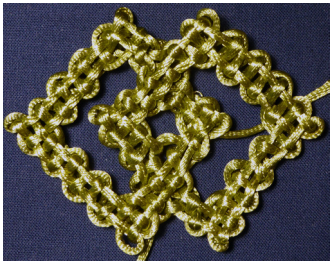
The one-cord method can be used for triangular and lens-shaped forms, but for the tear-drop and tear-shaped forms two cords make for much easier tying.

The tear-drop is often used as a frame for a small amulet. The example here, the 'carved coral' of the bottle gourd (for health) is a 7Lx4B TH doubled with a single strand 3Lx4B TH interwoven round the lower end.

(It was tied in 'scoubidou' plastic string as the Covid lockdown limited me to what was available in the house.)

The heart-form was more generally associated with the leaf of a peepul tree (*Ficus religiosa*) or, upside down, the petals of a lotus flower (*Nelumbo nucifera*). It was only in the 20th century that the occidental connotations came in.

It is also possible to tie stencil forms, ie a voided shape in a solid frame, using several cords, but I do recommend pinning the cord over graph paper. The first time I attempted my own design, the knot would not pull up tidily whatever I did. And it was only on the 14th attempt that I spotted where I had lost a pair of bights in one section! Using pins and graph paper would have saved a lot of time and effort!



Also, sometimes a form can be tied with more than one voided space. The double-diamond form, possibly symbolic of championship or victory (though I have only seen this name in one 20th century newspaper article), is one such shape. In her second volume on Chinese knots, Lydia Chen shows a method for tying this with a single length of cord.

However, it may be tied by using two cords in a basic Pan Chang squiggle. Looking at the example in two colours, it is clear how much more easily it may be done.

OBITUARIES

Maritime community mourns rigging legend

Brion Toss, a master rigger, knot-enthusiast, wooden boat lover and maritime legend, died June 6 aged 69.

COURTESY PHOTO Lily Haight lhaight@ptleader.com The Leader

On a still day at the Point Hudson Marina, among the echoing seagull cries and the soft sound of water lapping against boat hulls, it was not unusual to hear the booming laughter of master rigger Brion Toss. It would ring out over the horizon, and the best place to look for the origin of the jolly sound was up toward the sky.

Toss, a world-renowned master rigger, author, knot expert, and lover of wooden boats, died June 6 at the age of 69. Toss spent much of his life aloft, rigging everything from daysailers to massive square riggers.

When he wasn't aloft, Toss was in Port Townsend teaching, writing, philosophizing, and sharing hearty laughs with friends, family, and anyone who stopped by his rigging shop, Brion Toss Yacht Riggers, in the historic Point Hudson Marina.

He leaves behind his wife, Christian Gruye, and his kids, as well as many friends in Port Townsend. "What I'm going to miss most is his melodious booming laughter that would come up through the floorboards into the sail loft, or echo across the harbor when he was up a mast," said sailmaker Carol Hasse, a longtime friend and colleague of Toss.

Toss' career was born out of an obsession with knots more than 40 years ago. Born in Kentucky and raised in Seattle, Toss fell into a knot-tying rabbit hole when given a copy of "The Encyclopedia of Knots and Fancy Ropework."

In a 2015 interview, Toss recalled becoming obsessed with knots until he finally

asked himself, “What can you do with these things?” That led him to rigging.
At the first Wooden Boat Festival, Toss met Nick Benton. Toss said Benton taught him the many techniques of rigging, as well as how to think like a rigger. He soon met Emiliano Marino, who now owns the Artful Sailor in Port Townsend. The two rented a loft upstairs at Anacortes City Hall where Marino made sails and Toss made rigging. The two promised each other they would write books on their respective careers.
In 1984, Toss published “The Rigger’s Apprentice,” followed by Marino’s “The Sailmaker’s Apprentice.” The book is now considered the authoritative text on rigging and covers everything from a sailor’s most-needed knots, to maintaining rigs, turning tail splices, and wire eyesplices. “He was always striving to both innovate and carry the traditional craft forward,” Hasse said. “He certainly has an international renown for codifying, through writing and teaching age-old practices.” He traveled the world, rigging all types of ships and passing on his extensive knowledge in workshops and classes. “He brought such levity and creativity to his talks,” Hasse said. “He would get people involved. Someone would stand and be the mast, and another person would be the shroud. It was always something people could engage with.”
He valued self-sufficiency in a sailor, and taught skills necessary for sailors who want to be self-reliant on the water. “He was the consummate teacher,” said Kaci Cronkhite, former director of the Wooden Boat Festival, who met Toss through studying his knot-tying book. “Everything he did, it was not just a business, it was a philosophy of life and rigging tied together.” Beyond that, Toss acted as an instructor to the U.S. Coast Guard, among other organizations. Toss was always trying to design the ideal rig to make any boat sail better, faster and safer.
At the 2019 Wooden Boat Festival in Port Townsend, Toss was inducted into the Maritime Hall of Fame for his work carrying forward the traditional art of rigging. In his acceptance speech, he called for unity among the community. “He was saying, as rigging splices things together, our action, our words, our energy, splices us together,” Cronkhite said.
In September 2017, Toss released a collection of life stories about rigging ships in an e-book titled, “Falling.” The book features a collection of cautionary tales about working aloft, as Toss reflected on his lifetime of rigging. In the stories, Toss’s jovial sense of humor is balanced with a reverence for his work and the power of gravity.
“Life is unutterably precious, unbearably fragile, but it becomes flimsy and shallow if your primary aim is to preserve it,” he wrote in the final chapter of *Falling*. “Risk it. If you huddle in a safe space, you might live longer, but you will not be fulfilled. Risk your life, at some point, to some extent. Do it with

enough training and gear that your chances of survival are excellent. But do something that will let you know how close Death is, and how amazing Life is." A celebration of Toss' life is being planned for a future date. His family has created a Facebook page called Brion Toss Life Memories so friends and community members can share stories, photos, videos and memories of his life.

Brion Toss Rigger & Writer Extraordinaire

May 11th 1951- June 6th 2020

The news of the death of Brion Toss came to me just as *Knotting Matters* issue 147 arrived and by strange coincidence, there were in my mind three connections with Brion in it. Geoffrey Buddworth mentioned him, page 43. The question by Colin Byfleet, page 30 about the illustrations for the Double Constrictor knot comes from one of Brion's books; depending on the exact layout, either from *The Rigging Handbook* or *The Complete Rigger's Apprentice,* all drawn by Robert Shetterly. Whilst possibly my first correspondence with Brion Toss concerned the Matthew Walker Knot featured on page 26.

I became aware of Brion with the pieces he wrote for *Wooden Boat* magazine, back in 1981. As a fan, I think I must have begun an exchange of letters, I can see the yellow note paper quite clearly. It was completely unknown in the UK at the time. When the *The Rigger's Apprentice c*ame out, I immediately got a copy and somehow found myself encouraging the British publisher, Stanford Maritime, to bring out a British edition which, frustratingly, they called *The Complete Rigger Wire & Rope,* and dropped the Tricks & Puzzles chapter, something that had rounded out and completed the US edition.

In 1986, IGKT was planning to hold an 'Extravaganza', celebrating Clifford Ashley's *The Ashley Book of Knots,* gathering together every knot from that knot tyers 'bible', tied by members from around the world. I invited Brion to stay with my family if he was minded to come, which happily he was.

So that was how I found myself, for the first time in my life, meeting someone at an airport. It never struck me until I was waiting at the Arrivals gate, that I had no idea what Brion looked like, and he would not know me. In my naivety, I did not have the requisite card with the person's name on to hold up. How was this going to work?

How would I know him from the hundreds of people coming through the Arrivals gate? By instinct? I need not have worried. There could only be one person who would be carrying a tarry ditty bag with a ropework handle. It was Brion Toss, all was well. We returned to my home in Ipswich. He had a rest and we took Brion to a local pub for lunch.

Afterwards somehow we found ourselves in the 15th century Ancient House,

home to a splendid bookshop in Ipswich. By good fortune, there was a copy of *The Complete Rigger* on the shelf for sale. Brion boldly took it down and signed it and put it back on the shelf.

I guess it was the next day we loaded up a hired minibus with the ropy things needed for the Ashley 'Extravaganza'. My wife, 14-year old daughter, 12-year old son and Brion then drove to Charlton House, close to Greenwich, London, on the south east side of the River Thames. We set up the extensive displays of ropework from around the world, virtually every one of the 4,000 knots shown in *The Ashley Book of Knots* was there and at that moment Brion suddenly bent over something and put his back out. He was in agony. We managed to get him into the minibus, laying down flat, and got him to the home of local IGKT member, Desmond Manderville, with whom we were staying. A local chiropractor came to help Brion, but sadly Brion had to spend the rest of his week in England, flat on his back, just managing a visit to the Cutty Sark, to stand on her deck and admire her rig, before returning to the USA.

Over the years, we kept in touch lightly, by letter, phone, latterly by e-mail and the exchange of books. It was good to know that we were keeping some kind of special connection.

In 2017, I had the good fortune to be invited to speak at "Thou Shalt Knot", the exhibition celebrating the life and work of Clifford Ashley, at the New Bedford Whaling Museum. I was happy to find that one of my fellow speakers was Brion Toss, and even more than happy when I found that we were to share the Museum's study apartment for a few nights. When we met, it was as if there had not been 30 odd years since we had last met. We had a wonderful meal, Brion, his wife Christian, Liz and I. When they left the apartment, very early in the morning, to make their way back west, a goodbye note was left on that distinctive yellow note paper and they were gone; and now Brion is really gone.

Brion's books are a great gift to the world, preserving the knowledge that his practical experience and enquiring mind had accrued over the years. The books and all his other writings are his monument. Apart from the various magazine articles and website postings, the books are:

The Rigger's Apprentice International Marine Publishing, Camden, Maine 1984
UK edition: *The Complete Rigger Wire & Rope* Stanford Maritime, London 1985.
Knots Hearst Marine Books, New York, 1990.
The Rigger's Locker International Marine, Camden, Maine 1992
The Complete Rigger's Apprentice, McGraw -Hill Educational, New York 1998
UK edition: *The Rigging Handbook* Adlard Coles Nautical, London, 1998
Working Rope Book 5 Basic Braided Splices Xian Press, Port Townsend WA 2004
The Complete Rigger's Apprentice 2nd edition, McGraw -Hill Educational, New York 2016
Falling C-Star Press Port Townsend 2018

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Venue: The Ship Inn, Custom House Quay, Weymouth DT4 8BE

East Anglian - UK

Contact: Stuart Weston
pugwash1941@gmail.com
Tel: +44 (0)1449 674 327 or
+44 (0)7801 239 731
Venue: Windmill Room, Abbots Hall Primary School, Danescourt Ave, Stowmarket, Suffolk

Midlands - UK

Contact: Bruce Turley
bruce@btknots.co.uk
Tel: +44 (0)1214 534 124
Venue: The Old Swan Inn,
(Ma Pardoes), 89 Halesowen Road,
Netherton, Dudley, DY2 9PY

North West England - UK

Contact: Ian Rogers
iansrogers@aol.com
Tel: +44 (0)1606 590 729
Venue: Red Lion, 1 Wharton Rd, Winsford, Chester CW7 3AA and Tattenhall Marina, Newton Lane, Tattenhall, Chester CH3 9NE

Solent - UK

http://igkt-solent.co.uk
Contact: Chris Jenkins
igktchris@btinternet.com
Tel: +44 (0)2392 601 779
Venue: Fareham Sailing and Motor Boat Club, Lower Quay, Fareham, Hampshire PO16 0RA

Surrey - UK

www.surreyknots.org.uk
Contact: Tony Shellard
secretary@surreyknots.org.uk
Tel: +44(0)1483 502 156
Venue: Guildford District Scout Centre, Nightingale Road, Guildford, GU1 1ER

West Country Knotters - UK

Contact: Richard Hopkins
richardhopkins907@gmail.com
Tel: +44 (0)1179 867 146
Venue: The Benjamin Perry Boathouse, Phoenix Wharf, Lower Guinea Street, Bristol BS1 6TJ

Yorkshire - UK

Contact: David Pearson
wayzegoose_uk@yahoo.co.uk
Tel: +44 (0)113 257 2689
Venue: Pudsey Scout Headquarters, The Lanes, Pudsey, LS28 7AS

United States of America

Alaskan Branch - USA

Contact: Charles Rigden
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Tel: +(1) 1 928 231 2775
Venue: Anchorage Senior Center, 1300 East 19th Avenue, AK 99501

North American Branch - Knot in the Middle - USA

www.igktnab.org
Contact: John Staley
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Tel: +(1) 1 905 389 2509

North American Branch - Mid-Atlantic Region - USA

Contact: Michael Pollock
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Tel: +(1) 1 301 649 1165

Pacific Americas - USA

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Contact: Evie Cowper
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Tel: +(1) 1 310 679 6864
Venue: Los Angeles Maritime Institute 73 Berth Suite 2, San Pedro, CA 90731

All branch details as on IGKT website on 15/8/20

BACK COVER: Bill Bleakley's Small sling with shackle see article p24

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